

**Discussion and Notes**

For information and instructions on the materials needed and how to build a homemade spill control center, please visit the Flinn Scientific Web site at [www.flinnsci.com/Sections/Safety/ChemicalSafety/HomeSpillControl.asp](http://www.flinnsci.com/Sections/Safety/ChemicalSafety/HomeSpillControl.asp).

Please read page 112 in the 2008 Flinn Scientific Chemical & Biological Catalog/Reference Manual for a discussion of the health and environmental effects of mercury and how to clean up mercury spills.

## Chemical Spill Control

Spill control involves learning how to prevent and respond to chemical spills. To improve safety in the science department, review how to prevent chemical spills, make sure proper safety equipment is available to contain and control spills, and discuss the procedures to use in case of a spill.

### Preventing Chemical Spills

Preventing chemical spills is the most important safety precaution for spill control. Purchasing procedures, chemical storage rooms and prep areas, and lab activities should be designed to minimize the potential for chemical spills. Experiments should use the minimal amount of chemicals whenever possible.

- ◆ Purchase, store, and dispense hazardous chemicals in unbreakable, chemical-resistant bottles, such as HDPE plastic bottles or PVC-coated glass bottles.
- ◆ Purchase and store highly toxic or reactive substances in secondary containment devices, such as Chem-Saf bags (heavy-duty plastic bags) or Saf-Stor cans (metal paint cans).
- ◆ Purchase, store, and dispense chemicals from the smallest bottles possible. Do not dispense a chemical from a 500-mL bottle, for example, if each student needs only 1 mL.
- ◆ Do not store chemicals on the floor, in aisles, stairwells or fume hoods, on laboratory benches, or anywhere a bottle may be knocked over.
- ◆ Use microscale experiments whenever hazardous materials are used.
- ◆ Dispense chemicals from a central location (preferably a fume hood) and place all reagent bottles on a spill containment tray or on absorbent chemical pads.

### Spill Control Equipment

All chemical storage areas and labs should have proper spill control equipment, including a fire blanket, spill control materials, and a mercury spill control kit (if needed). A 100% wool fire blanket is an excellent spill control device because it will contain and control a spill and its vapors. If a spill occurs and other spill control materials are not available, simply throw the fire blanket over the spill. The blanket will help absorb the liquid, contain any vapors, and enable a person to walk around the spill area, if needed, to seek help.

Effective spill control materials include three components—sand, an absorbent agent, and a neutralizer. Spill control materials should be capable of handling a spill from the largest bottle in a storage room or lab, which is usually a 2.5-L acid bottle. Sand is used to surround and contain a spill, provide traction, and prevent the spill from spreading across the floor. An absorbent is added to contain and absorb spilled liquid so it is easier to clean up, transport, and dispose of. Neutralizer, usually sodium carbonate or calcium hydroxide, is used to neutralize inorganic acid spills. If concentrated bases such as ammonium hydroxide solution will be used in the department, it is a good policy to keep citric acid on hand to neutralize bases.

If mercury or mercury thermometers are used in your classroom, mercury spill control materials should be readily available. Mercon™ spill control spray, wipes, and sponges are available from Flinn Scientific and are ideal for cleaning up mercury spills. Sprinkling zinc dust on the spill area is also effective for cleaning up small droplets of mercury. Zinc dust reacts with mercury to form a stable and safe amalgam that is easy to handle and safe to dispose of in the trash.

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*A Chemical Hygiene Plan (CHP) is a requirement of the federal Laboratory Standard or "Right to Know" Law—45 states have also adopted this requirement. If you do not currently have a CHP, please e-mail us at [flinn@flinnsci.com](mailto:flinn@flinnsci.com) to request a free electronic copy of our model Chemical Hygiene Plan template. This document contains the basic safety regulations and is easy to alter to meet your school's needs.*

## Spill Control Procedures

A written contingency plan on how to handle chemical spills should be part of every school's Chemical Hygiene Plan. The following procedure is an example of a contingency plan.

1. Quickly assess the spill, its hazards, and the danger to yourself and your students. If the nature of the spilled chemical(s) is unknown, assume the worst and evacuate.
2. Notify other laboratory personnel of the accident and evacuate the area, if necessary. Your top priority should always be your own safety and the safety of your students. Restrict all unprotected personnel and students from the spill area.
3. Immediately tend to any injured or contaminated person and if necessary, request help. If a chemical is splashed into an eye or onto skin and clothing, immediately irrigate using an eyewash or shower.
4. If the spilled chemical is volatile, ventilate the area or evacuate. If the spilled chemical is flammable, remove all ignition sources (flames, sources of heat, and electrical equipment).
5. Take steps to contain and limit the spill if this can be done without risk of injury or contamination. Wear appropriate personal protective equipment, including chemical splash goggles, chemical-resistant gloves, and a chemical-resistant apron.
6. Gently pour sand around the spill and onto the spill to contain the spill and prevent it from spreading,
7. Pour absorbent material (cat litter or oil absorbent) around the spill and onto the spill to absorb the liquid and also contain any vapors. For best results, gently sprinkle the spill control material onto the spill to avoid further spreading.
8. If the spill is an inorganic acid or base, apply the appropriate neutralizer around the spill and onto the spill. Mix the neutralizer with the sand and absorbent using a plastic broom.
9. Wait until the mixture is cool and dry before cleaning up. Use a plastic dustpan and plastic broom to sweep up the solid residue and place into a large, heavy-duty plastic garbage bag for disposal.
10. Dispose of contaminated materials properly.
11. Call in additional school or emergency personnel if at any time your safety or that of your students is in jeopardy or if you do not feel comfortable with performing the cleanup.

## Flinn Scientific Values Your Support

Without your orders, the safety training notes and the indispensable *Flinn Scientific Catalog/Reference Manual* would not be possible. Please continue to support our efforts to improve safety in school science labs by sending Flinn Scientific your valuable orders.

## Next Month's Topic

### Biotechnology Safety Issues



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## Chemical Spill Control

No matter what precautions are taken, sooner or later an accidental chemical spill will occur. It is important to know how to prevent spills, make sure proper safety equipment is available to contain and control spills, and understand how to use spill control equipment. This month's safety training notes review the basic principles of preventing and responding to laboratory chemical spills. With proper equipment, procedures, and training, many spills can be prevented and spills that do occur can be handled safely and effectively.

The safety meeting should take 6–8 minutes to present. The discussion period will vary depending on the issues that need to be addressed or additional question that teachers may have.

It is important to keep a copy of these safety training notes and a signed attendance sheet to verify that regular safety training meetings are being held. The sign-up sheet is almost as important as the training notes and is usually the first thing that is requested and reviewed by regulatory inspectors. A copy of the sign-up sheet we suggest using can be found at [www.flinnsci.com/Sections/Safety/SNotes/signup.pdf](http://www.flinnsci.com/Sections/Safety/SNotes/signup.pdf).

### Materials (one per staff member)

- ◆ Flinn Scientific Science Department Safety Training Notes, Volume 8-7
- ◆ Sign-up Sheet (one for group)

### Discussion Topics

1. Review and assess the location of spill control equipment in the science department.
2. What is the department policy or safety contract policy with regard to having students clean up minor spills on their bench? Should a teacher be involved to make sure the spill is properly cleaned?
3. If time allows, simulate a chemical spill with water and use sand as the control material. Note how quickly the "spill" spreads. Practice applying the spill control material around the spill and then onto the spill. Training is one of the most important components of an effective safety program.

### We Welcome Your Comments

Are the Science Department Safety Training Notes useful to you? Are they working for you and your department? If you have any suggestions for topics that you would like to see covered or for how we can improve these notes, we would really like to hear from you! Please e-mail us with your comments and suggestions. Our e-mail address is [flinn@flinnsci.com](mailto:flinn@flinnsci.com).